REMARKS

By Office Action dated June 2, 2003, all pending claims stand rejected, reconsideration of which is respectfully requested in view of the following remarks. Claims 7-51 have been cancelled. Claims 1-6 are now pending.

Rejection Under 35 U.S.C. § 112, First Paragraph

Claims 1-6 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of adequate written description. More specifically, the Examiner is of the opinion that there is no support in the originally filed specification for the negative limitation added to claim 1, namely, that the alternating copolymer is not a copolymer of maleic anhydride and isobutylene. As set forth on pages 2-3 of the Office Action, the Examiner points to *In re Kaslow*, 707 F.2d 1366 (Fed. Cir. 1983), as providing support for this conclusion.

Applicants respectfully traverse this basis of rejection, including the Examiner's interpretation of *In re Kaslow*. The use of negative provisos, such as the negative limitation added to claim 1, to excise a species disclosed in the prior art from the scope of a claimed genus is permissible and does not constitute the addition of new matter in view of *In re Johnson*, 194 U.S.P.Q. 187 (C.C.P.A. 1977).

As noted by the Examiner, *In re Kaslow* supports the general proposition that "the test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter". *Id.* at 1375. However, Applicants note that the issue in *In re Kaslow* was whether an additional claim element introduced during prosecution was sufficiently supported by the specification even though such element was not specifically recited therein. The question of whether the use of a negative proviso to exclude a species from the scope of a claimed genus constitutes the addition of new matter was not raised in *In re Kaslow*. Accordingly, Applicants submit that *In re Johnson*, in which this later inquiry was considered, should be relied upon for guidance rather than *In re Kaslow*.

As noted above, it was decided in *In re Johnson* that the use of negative provisos to excise a species disclosed in the prior art from the scope of a claimed genus is permissible. In *In re Johnson*, the applicants claimed a genus of certain thermoplastic polymers and, during prosecution, amended the claims to exclude several known prior art species that fell within the claimed genus. In reversing the Board's decision that no basis existed in the application for the "limited genus" claimed by the applicants, the CCPA held that:

> "The notion that one who fully discloses, and teaches those skilled in the art how to make and use, a genus and numerous species therewithin, has somehow failed to disclose, and teach those skilled in the art how to make and use, that genus minus two of those species, and has thus failed to satisfy the requirements of § 112, first paragraph, appears to result from a hypertechnical application of legalistic prose relating to that provision of the statute." *Id.* at 196.

The CCPA further noted that the "specification, having described the whole, necessarily described the part remaining" and that the applicants "are merely excising the invention of another, to which they are not entitled, and are not creating an 'artificial subgenus' or claiming 'new matter'". *Id.* at 196.

Similarly, in the present application, Applicants have merely amended the claims in order to advance prosecution to exclude a species disclosed in the prior art, and disclosed in the specification at page 14, lines 4-8, from a genus which is fully supported in the specification. Accordingly, Applicants submit that the written description requirement is satisfied for the pending claims and respectfully request that this basis of rejection be withdrawn.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 1-6 remain rejected under 35 U.S.C. § 112, second paragraph, as being indefinite due to the use of the term "finely divided," for the reasons set forth on pages 2-3 of the Office Action dated December 4, 2002. Again, Applicants respectfully traverse this ground of rejection and submit that the scope of this term would be clear to one of ordinary skill in the art.

The Examiner has not been persuaded by Applicants' arguments set forth on pages 4-5 of the Amendment dated May 5, 2003. However, Applicants maintain that, in view of the references cited in such Amendment; namely, Tharwat F. Tadros, *Surfactants in Agrochemicals* (Marcel Dekker, Inc.); Earl K. Fischer, *Colloidal Dispersions* (John Wiley & Sons Inc.); and R.D. Nelson, *Dispersing Powders in Liquids* in Handbook of Powder Technology, Vol. 7, 1995, one of ordinary skill in the art would clearly understand what is meant by "finely divided" and be able to ascertain the requisite particle size. More specifically, it is clear from the foregoing references that, having regard to the type of formulation (SC, WP or WG required), the physical chemistry is such that only a particular range of particle sizes could be used in the claimed application. Dispersion stability of any colloidal system, such as pigments, inks or pharmaceuticals, requires the same small particle size. As further support for such arguments, enclosed are relevant pages from a well known reference explaining dispersion stability; namely, Robert J. Hunter, *Foundations of Colloid Science* (Clarendon Press).

In addition, Applicants submit that one of ordinary skill in the art would appreciate that, since the standard spray filter size used by farmers is approximately 100 microns in size, any formulation in which the primary particle size of the active ingredient exceeds this size would be clearly unusable. Furthermore, the Food and Agriculture Organization of the United Nations (FAO) Specifications for SC, WP and WG formulations set forth a number of tests, including a wet-sieve retention test, which may be used to determine the suitability of a particular formulation, including the formulation particle size. A number of these tests are described in the specification at page 19, line 1 through page 21, line 16 and a copy of the Australian National Registration Authority Guidelines, which follow the FAO specifications, is enclosed.

Accordingly, in view of the foregoing, Applicants again respectfully submit that the pending claims satisfy the second paragraph requirements of §112, namely that the term "finely divided" would not be indefinite to one of ordinary skill in the art, and request that this ground of rejection be withdrawn.

Rejections Under 35 U.S.C. § 102(b)

Kataoka, Kataoka and Nabeya

Claims 1-6 remain rejected under 35 U.S.C. § 102(b) as anticipated by Kataoka et al. (Japanese Patent No. 58131903), Kataoka et al. (Japanese Patent No. 02111703) and Nabeya et al. (Japanese Patent No. 06009302). More specifically, the Examiner has rejected Applicants' argument that none of the cited references disclose an *alternating* copolymer within the scope of pending independent claim 1. Again, Applicants respectfully traverse this ground of rejection.

The Examiner's maintenance of the foregoing rejection appears to be based on the belief that unless a polymer is fully random, it must be alternating. Applicants respectfully disagree. By its very nature "random" means that some portions of the polymer sequence will contain consecutive monomers while others will not. Accordingly, pointing out that the polymers disclosed in cited references may have some alternating groups does not make them non-random (*i.e.*, alternating). Similarly, the presence of a minute number of consecutive monomers in polymers made below 90°C does not make such polymers non-alternating (*i.e.*, random).

As is well known in the art, it would be an impossible task to define any polymer of substantial molecular weight with reference to its specific structure and composition. Every monomer reaction to add to a polymer chain is an equilibrium reaction based on energetic considerations. Accordingly, while the likelihood of, for example, alphamethylstyrene and maleic anhydride reacting with each other is, say 10,000 times, more likely to occur than for alphamethylstyrene to react with itself, and, say 100,000 times, more likely than for maleic anhydride to react with itself, in a given polymer at least some monomers will be found to be consecutive, even if this a minute number. One of skill in the art would appreciate that a polymer reaction where the equilibrium is clearly biased towards a monomer reacting with a different monomer, over any individual monomer reacting with itself, is understood to produce an alternating copolymer. For the Examiner's reference, enclosed are relevant pages from J.M.G. Cowie, *Alternating Copolymers*, which further describe the foregoing principles.

Furthermore, Applicants wish to draw the Examiner's attention to the disclosure at page 9, line 2 through page 10, line 4 of the specification, wherein alternating copolymers are

described. In view of this passage, one of ordinary skill in the art would have no difficulty in determining whether or not a given copolymer was "alternating" within the scope of the claimed invention.

With respect to the references cited by the Examiner, Applicants maintain that none of such references disclose each and every element of pending claim 1. In particular, and as recognized by the Examiner, none of the cited references specifically disclose *alternating* copolymer dispersants. However, as set forth on page 4 of the Office Action dated June 18, 2002, the Examiner is of the opinion that the disclosed copolymer, namely, an alternating polymer of styrene/maleic anhydride, would inherently be alternating due to the reactivity of the monomers. Applicants strongly disagree.

To support an anticipation rejection based on inherency, the Examiner must provide a factual and/or technical basis reasonably establishing that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. *See Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *see also*, *Schering Corp. v. Geneva Pharmaceuticals, Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citing *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991)) and *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981) (holding that inherency must flow as a necessary conclusion from the prior art, not simply a possible one).

In view of the previously submitted excerpt from J.M.G. Cowie, *Alternating Copolymers* (submitted with Applicants' Amendment dated October 15, 2002), it is known that when maleic anhydride is copolymerized with stryrene, the copolymerization becomes increasingly random at temperatures greater than 90°C. Thus, at temperatures in the range of 150-180°C, as disclosed in the English translation of Kataoka et al. (JP 58131903) (submitted with Applicants' Amendment dated May 5, 2003), one of ordinary skill in the art would not reasonably expect such copolymerization to necessarily produce a copolymer that is "alternating" within the scope of the present invention. To the contrary, under the high temperature polymerization conditions disclosed in Kataoka et al. (JP 58131903), one of ordinary skill in the art would reasonably expect the resulting copolymer to be random.

Accordingly, Karaoka et al. (JP 58131903) does not disclose, teach, or suggest, either specifically or inherently, an *alternating* copolymer.

With respect to Kataoka et al. (JP 02111703) and Nabeya, both references are entirely silent as to the specific conditions under which the disclosed copolymers were produced. For the Examiner's reference, enclosed are English translations of Kataoka et al. (JP 02111703) and Nabeya, for which Applicants have now obtained translations. As discussed at page 9, line 2 through page 10, line 4 of the specification, alternating copolymers are only obtained by careful selection and observation of the reaction conditions. Accordingly, in the absence of any description regarding the preparation of the copolymers disclosed in Kataoka et al. (JP 02111703) and Nabeya, one of ordinary skill in the art could not reasonably conclude that such copolymers are *necessarily* alternating. As set forth above, for the cited references to be anticipatory, they must either specifically or inherently disclose the clamed subject matter, namely, an *alternating* copolymer. Clearly, neither Kataoka et al. (JP 02111703) nor Nabeya *specifically* disclose alternating copolymers and, for the reasons set forth previously, one of ordinary skill in the art would not view Kataoka et al. (JP 02111703) and/or Nabeya as *inherently* disclosing alternating copolymers.

Accordingly, Applicants maintain that none of the cited references anticipate pending claim 1, and request that this ground of rejection be withdrawn.

Narayanan

Claims 1-3, 5 and 6 remain rejected under 35 U.S.C. §102(b) as anticipated by Narayanan et al. (U.S. Patent No. 5,476,662) for the reasons set forth on page 5 of the Office Action dated June 18, 2002. In rejecting Applicants' arguments set forth in the Amendment dated May 5, 2003, the Examiner states that low melting point solids are not excluded from the scope of Applicants' pending claims. However, it appears the Examiner may not have considered the fundamental difference between Narayanan and the present invention; namely, that Narayanan discloses the formation of emulsions and the present invention is directed to the formation of dispersions. Accordingly, Applicants again traverse this ground of rejection and request that the Examiner reconsider Applicants previous arguments.

As set forth previously, a distinguishing feature of the present invention is that it relates to a dispersion of finely divided solid material (*i.e.*, a suspension). Rather than disclosing such a dispersion, Narayanan discloses combining a low melting point solid with a copolymer to form a solid complex and, subsequently dispersing such complex in water *as a stable emulsion. See, e.g.*, Summary of the Invention, at column 1, lines 41-67, of Narayanan.

One of ordinary skill in the art would appreciate that, at the molecular level, the process of forming an emulsion disclosed in Narayanan is fundamentally different than dispersing a water insoluble solid in water as per the present invention. In Narayanan, reference to "low melting solids" applies to active ingredients which are commonly solid at ambient temperatures, but which can be readily liquefied and form emulsions as per the process of Narayanan. In such an emulsion, the stabilizing surfactant (the emulsifier) is absorbed into droplets of immiscible liquid and sits at the immiscible liquid/water interface. In this way, the emulsifier is partly dissolved in the liquid or low melting point solid being emulsified, and generally has both a hydrophobic and a hydrophilic portion. Therefore, the emulsifier need not be water soluble itself.

In contrast, in a dispersion of a water insoluble solid in water as per the present invention, the stabilizing surfactant (the dispersant) is adsorbed onto the surface of the solid. In order to disperse the water insoluble solid, the dispersant must necessarily be water soluble (as recited in pending claim 1). In this way, the physiochemical requirements of an emulsifier are quite different than that of a solid particulate dispersant (*i.e.*, suspension stabilizer) and clearly the suitability of a particular copolymer for one purpose cannot be equated with a suitability for the other.

Accordingly, Applicants maintain that Narayanan is directed to emulsions (as opposed to dispersions) and does not disclose a method of dispersing an active, finely divided, water-insoluble, solid agrochemical principal in an aqueous solution as recited in pending claim 1 and request that this ground of rejection be withdrawn.

Rejection Under 35 U.S.C. § 103(a)

Claims 1-6 remain rejected under 35 U.S.C. § 103(a) as obvious over Robinson et al. (U.S. Patent No. 4,102,667). More specifically, and as set forth in the Office Action dated December 4, 2002, the Examiner is of the opinion that Robinson teaches aqueous dispersion/suspensions prepared by suspending agrochemicals and an alternating copolymer of maleic acid/anhydride and a conjugated diene such as butadiene and/or isoprene. While the Examiner recognizes that Robinson does not recite a sequence of steps wherein the agrochemical is combined with the alternating copolymer prior to their dispersion in water, the Examiner concludes that it would have been obvious to add the two components to the water simultaneously.

In rejecting Applicants' argument that Robinson contains no teaching or suggestion that the disclosed alternating copolymer be used as a dispersant for water insoluble agrochemicals as per the claimed invention, the Examiner stated that "it does not matter if the water-soluble polymers are termed as dispersants or drift reducing additives, they would essentially serve the same purpose once combined" and that "dispersants also enhance the formation of large, stable droplets" (page 6 of the Office Action dated June 2, 2003). Applicants respectfully disagree with this generalization.

The droplet size of liquids when sprayed is a function, not of dispersant functionality, but of the surface tension properties of the surfactants within such liquids. Although almost any surfactant can act as a dispersant to some extent, it would be a tenuous interpretation to describe all surfactants as dispersants. For example, dispersant function is not contingent on a particular surface tension profile. Some surfactants which might be described as dispersants have a low surface tension (*e.g.*, non-ionic surfactants, such as nonylphenyl ethoxylates of less than 20 EO), while others (*i.e.*, high build ethylene oxide/propylene oxide block copolymers) have very high surface tensions. The fact that some dispersants can have an influence on spray droplet size does not necessarily mean it is generally understood by those of ordinary skill in the art that all dispersants have this effect. The generalization that dispersants enhance the formation of large stable droplets in every case is clearly incorrect. In support of the foregoing, enclosed is a paper (Miller, Hewitt and Bagley, "Adjuvant Effects on Spray

Characteristics and Drift Potential" *Pesticide Formulations and Application Systems: Twenty First Volume, ASTM STP 1414*) describing the surface property parameters, which are independent of dispersant functionality, required in spray drift models.

Additionally, in rejecting Applicants' argument that the levels at which Robinson discloses that the copolymers can be used are either below or far in excess of levels which function as dispersion stabilizers, the Examiner states that such functional levels are not recited in the pending claims. However, notwithstanding the foregoing, Applicants note that the pending claims refer to the copolymer as a "dispersant." Thus, the amount of copolymer utilized must be sufficient to act as a dispersant.

In summary, Applicants respectfully submit that Robinson contains no teaching, suggestion or motivation to use the disclosed alternating copolymers as a dispersant for water insoluble agrochemicals according to the claimed method. Accordingly, Applicants submit that the cited reference fails to establish a *prima facie* case of obviousness against claims 1-6, and request that this ground of rejection be withdrawn.

In view of the above remarks, allowance of claims 1-6 is respectfully requested. A good faith effort has been made to place this application in condition for allowance. However, should any further issue require attention prior to allowance, the Examiner is requested to contact the undersigned at (206) 622-4900 to resolve the same. Furthermore, the Commissioner is authorized to charge any additional fees due by way of this Response, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

Andrew Francis Kirby et al.

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Enclosures:

Hunter, Robert J., Foundations of Colloid Science, Vol. I, pp 89, 134 and 135 (1987)
National Registration Authority for Agricultural and Veterinary Chemicals, *Draft Guidelines for the Generation of Storage Stability Data of Agricultural Chemical Products as of 7 September 2001*, pp. 2-24
Cowie, J.M.G. ed., Alternating Copolymers, *Principles of Alternating Copolymerization*, pp. 1-3, and 8-9
Translation of Japanese Patent Application No. HEI 2[1990]-111703, pp. 1-9
Translation of Japanese Patent Application No. JP1994009302A, pp. 1-13
Miller, Paul C.H. et al., *Adjuvant Effects on Spray Characteristics and Drift Potential*, 10 pages (2002)

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